



Hysol® EA 934NA

Epoxy Paste Adhesive

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Description

Hysol EA 934NA is a two-component thixotropic paste adhesive, which cures at room temperature and possesses superior strength to 300°F/149°C and higher. Its thixotropic nature and good compressive strength make it ideal for potting, filling and fairing, as well as for shim applications. Hysol EA 934NA is qualified to MMM-A-132 Type 1, Class 3 with a room temperature cure.

Features

Room Temperature Cure
Good Gap Filler
300°F/149°C Performance
Potting Material
MMM-A-132 Qualified
Develops Strength Rapidly

Uncured Adhesive Properties

	<u>Part A</u>	<u>Part B</u>	<u>Mixed</u>
Color	Gray	Amber	Gray
Viscosity @ 77°F	3500–9000 Poise	10 - 30 Poise	800 Poise
Brookfield, HBT	Spdl 7 @ 20 rpm	Spdl 1 @ 20 rpm	Spdl 6 @ 20 rpm
Viscosity @ 25°C	350 - 900 Pa·S	1 - 3 Pa·S	80 Pa·S
Brookfield, HBT	Spdl 7 @ 2.1 rad/s	Spdl 1 @ 2.1 rad/s	Spdl 6 @ 2.1 rad/s
Density (g/ml)	1.5	0.96	1.36
Shelf life			
@ 0°F/-18°C	1 year	1 year	
@ <40°F/4°C	1 year	1 year	
@ <77°F/25°C	3 months	1 year	
@ <90°F/32°C	2 months	1 year	

Note: Volume measurement is not recommended for structural applications unless special precautions are taken to assure proper ratios.

This material will normally be shipped at ambient conditions, which will not alter our standard warranty, provided that the material is placed into its intended storage upon receipt. Premium shipment is available upon request.

Handling

Mixing - This product requires mixing two components together just prior to application to the parts to be bonded. Complete mixing is necessary. The temperature of the separate components prior to mixing is not critical, but should be close to room temperature (77°F/25°C).

<u>Mix Ratio</u>	<u>Part A</u>	<u>Part B</u>
By Weight	100	33

Pot Life (450 g mass) 40 minutes @ 77°F/25°C
Method - ASTM D2471 in water bath.

Application

Mixing - Combine Part A and Part B in the correct ratio and mix thoroughly. THIS IS IMPORTANT! Heat buildup during or after mixing is normal. Do not mix quantities greater than 1 pound as dangerous heat buildup can occur causing uncontrolled decomposition of the mixed adhesive. TOXIC FUMES CAN OCCUR, RESULTING IN PERSONAL INJURY. Mixing smaller quantities will minimize the heat buildup.

Applying - Bonding surfaces should be clean, dry and properly prepared. For optimum surface preparation consult the Hysol Surface Preparation Guide. The bonded parts should be held in contact until the adhesive is set. Handling strength for this adhesive will occur in 8 hours @ 77°F/25°C, after which the support tooling or pressure used during cure may be removed. (Alternates are: 20 minutes @ 140°F/60°C, or 1 minute @ 205°F/96°C.) Since full bond strength has not yet been attained, load application should be small at this time.

Curing - This adhesive may be cured for 5 to 7 days @ 77°F/25°C to achieve normal performance. Accelerated cures up to 200°F/93°C (for small masses only) may be used as an alternative. For example, 1 hour @ 200°F/93°C will give complete cure.

Cleanup - It is important to remove excess adhesive from the work area and application equipment before it hardens. Denatured alcohol and many common industrial solvents are suitable for removing uncured adhesive. Consult your supplier's information pertaining to the safe and proper use of solvents.

Bond Strength Performance

Tensile Lap Shear Strength

Tensile lap shear strength tested per ASTM D1002 after curing for 7 days @ 90°F/32°C.

Adherends are 2024-T3 bare aluminum treated with phosphoric acid anodized per ASTM D3933.

Test Temperature, °F/°C	Typical Results	
	psi	MPa
-67/-55	2,800	19.3
77/25	3,100	21.4
180/82	1,800	12.4
300/149	1,000	6.9
500/260	450	3.1

After exposure to*:

	Typical Results	
	psi	MPa
77°F/25°C Water - 30 days	3,500	24.1
Isopropyl Alcohol - 7 days	3,300	22.7
Hydraulic Oil - 7 days	3,500	24.1
JP-4 Fuel - 7 days	3,500	24.1
Salt Spray - 105°F/41°C - 30 days	3,300	22.7

*All exposures tested @ 77°F/25°C

Specifications

The above values are typical results under ideal conditions. To establish certification values, please refer to the Henkel Aerospace Specification which defines quality control test values, methods and procedures. For a copy of the Henkel Aerospace Specification, contact Henkel's Literature Desk at (925) 458-8000.

Service Temperature

Service temperature is defined as that temperature at which this adhesive still retains 1000 psi/6.9 MPa using test method ASTM D1002 and is approximately 300°F/149°C.

Henkel QC Acceptance Testing

This data sheet provides users with typical properties obtained from this adhesive. These values are not meant to be used to develop aerospace QC acceptance testing. Users interested in establishing values and tests for routine QC acceptance should request our internal specification (DAS), which provides detail test methods and values used to certify this adhesive.

Bulk Resin Properties

Tensile Properties - tested using 0.125 inch/3.18 mm castings per ASTM D638.

Tensile Strength @ 77°F/25°C	5,800 psi	40.0 MPa
Tensile Modulus @ 77°F/25°C	550 ksi	3790 GPa
Elongation at Break, @ 77°F/25°C	1.2%	
Shore D Hardness @ 77°F/25°C	85	
Tg dry		
(Cure 7 days @ 77°F/25°C)	159°F	71°C
(Cure 1 hour @ 200°F/93°C)	264°F	129°C

Compressive Properties - tested using 0.5 inch/12.7 mm castings per ASTM D695.

Compressive Strength @ 77°F/25°C (ultimate)	9,500 psi	65.5 MPa
Compressive Strength @ 300°F/149°C (ultimate)	2,500 psi	17.2 MPa

Electrical Properties - tested per ASTM D149, D150.

Dielectric Constant (1KHz, 77°F/25°C)	7.24
Dissipation Factor (1KHz, 77°F/25°C)	0.028

Handling Precautions

Do not handle or use until the Material Safety Data Sheet has been read and understood.
For industrial use only.

General:

As with most epoxy based systems, use this product with adequate ventilation. Do not get in eyes or on skin. Avoid breathing the vapors. Wash thoroughly with soap and water after handling. Empty containers retain product residue and vapors, so obey all precautions when handling empty containers.

PART A

CAUTION! This material may cause eye and skin irritation or allergic dermatitis. It contains epoxy resins.

PART B

WARNING! This material causes eye and skin irritation or allergic dermatitis. It contains amines.

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Users should review the Materials Safety Data Sheet (MSDS) and product label for the material to determine possible health hazards, appropriate engineering controls and precautions to be observed in using the material. Copies of the MSDS and label are available upon request.

